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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/647,321

08/26/2003

Susumu Kinoshita

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EXAMINER

DIACOU, ARI M

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/647,321	<b>Applicant(s)</b> KINOSHITA ET AL.	
	<b>Examiner</b> ARI M. DIACOU	<b>Art Unit</b> 3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 35-39, 41, 42, 44 and 46-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 35-39, 41, 42, 44 and 46-48 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

***Prosecution Reopened***

1. In view of the Appeal Brief filed on 11-19-2007, PROSECUTION IS HEREBY REOPENED. A new grounds of rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

/Jack W. Keith/

Supervisory Patent Examiner, Art Unit 3663

***Response to Arguments***

2. In the appeal brief filed 11-19-2007, applicant argued the following:

A. In section VII, that Sugaya does not teach all the aspects of the claimed invention.

3. Argument A is moot in view of the new grounds of rejection.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 35-38, 41-42 and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakabayashi et al. (USP No. 5600481).

- Regarding claim 35, Nakabayashi discloses an optical amplifier comprising:
  - a plurality of optical amplification mediums [Fig. 20, #19 = Fig. 19, #14] for producing a gain, the gain having gain characteristics of a wavelength band; [Col. 2, lines 11-12]
  - a gain controller [Fig. 19, #10] constantly maintaining [Col. 8, line 5-9] the gain for each optical amplification medium; [Col. 6, lines 48-54] and

- a gain-equalizer [Fig. 19, #13] positioned after each optical amplification medium [Fig. 19, #14], and equalizing the gain-characteristic of a predetermined wavelength band of the optical amplification mediums [Col. 8, lines 6-7], each gain-equalizer equalizing each output light of the preceding optical amplifier medium [Col. 8, lines 15-19], and passing light with the predetermined wavelength band [Col. 8, lines 15-16], the light of the predetermined wavelength band having flat optical power characteristics [Col. 8, line 7],
  - Regarding claim 36, Nakabayashi discloses [Col. 8, lines 1-4].
  - Regarding claim 37, Nakabayashi discloses [Fig. 21] and [Col. 8, lines 10-14 (it appears here that this citation is referring to Fig. 21, not Fig. 20)]
  - Regarding claim 38, Nakabayashi discloses [Col. 8, line 9].
  - Regarding claim 41, Nakabayashi discloses [Col. 8, line 17].
  - Regarding claim 42, Nakabayashi discloses [Col. 8, line 15-17].
  - Regarding claim 44, Nakabayashi discloses [Col. 8, line 7].
6. Claim 46 is rejected under 35 U.S.C. 102(b) as being anticipated by Nakabayashi et al. (USP No. 5600481) in light of Becker et al. (NPL).
- Regarding claim 35, Nakabayashi discloses An optical amplifier comprising:
    - a plurality of optical amplification mediums [Fig. 20, #19 = Fig. 19, #14] for producing a gain, the gain having gain characteristics of a wavelength band; [Col. 2, lines 11-12]

- a gain controller [Fig. 19, #10] constantly maintaining [Col. 8, line 5-9] a constant population inversion ratio [Becker states on page 158, Eq. 6.13 and next two lines, that “This shows that the signal gain after traversal of the fiber is dependent only on the average inversion of the erbium ions in the fiber”, therefore performing constant gain control, as performed in Nakabayashi is inherently maintaining a constant population inversion ratio] for each optical amplification mediums; [Col. 6, lines 48-54] and
- a gain-equalizer [Fig. 19, #13] positioned after each optical amplification medium [Fig. 19, #14], and equalizing the gain-characteristic of the wavelength band of the optical amplification medium [Col. 8, lines 6-7], each gain-equalizer equalizing each output light of the preceding optical amplifier medium [Col. 8, lines 15-19], and passing light with a predetermined wavelength band [Col. 8, lines 15-16], the light of the predetermined wavelength band having flat optical power characteristics [Col. 8, line 7],

7. Claims 35, 38 and 39 are rejected under 35 U.S.C. 102(e) as being anticipated by Kinoshita et al. (USP No. 2002/0001124). This rejection can be overcome by perfecting priority to the Japanese patent documents that applicant claims priority to. No certified translations exist in either the current case (10/637321), or its parent (09/790507). Because there is a substantial quantity of relevant art published between 23 FEB 2000 (applicant's priority date if perfected) and 23 FEB 2001 (applicant's

current priority date) it is requested that applicant perfect priority in response to this office action.

- Regarding claim 35, Kinoshita discloses an optical amplifier comprising:
  - a plurality of optical amplification mediums [Fig. 6, #11, #12, #13] for producing a gain [¶0069], the gain having gain characteristics of a wavelength band; [¶0066]
  - a gain controller [Fig. 6, #50] constantly maintaining [Col. 8, line 5-9] the gain for each optical amplification medium; [¶0066: “50 represents an automatic gain control circuit (AGC)”] and
  - a gain-equalizer [Fig. 6, GEQ'(n)] positioned after each optical amplification medium [Fig. 6, EDF(n)], and equalizing the gain-characteristic of a predetermined wavelength band [¶0070: “1490 to 1530 nm”] of the optical amplification mediums [“EDF segment”], each gain-equalizer equalizing each output light of the preceding optical amplifier medium [¶0070], and passing light with the predetermined wavelength band [¶0070], the light of the predetermined wavelength band having flat optical power characteristics [Figs. 3 and 4, white box from 1490-1530nm, see also ¶0072],
- Regarding claim 38, Kinoshita discloses Fig. 6, EDF1, EDF2, EDF3.
- Regarding claim 39, Kinoshita discloses 0.9 in [¶0072].

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Naito as applied to claim 35 above, and further in view of Becker (NPL). Naito discloses the



invention with all the limitations of claim 35, but fails to disclose an inversion ratio of 0.8 thru 1.0. Becker teaches that a 14m EDF pumped with 40 mW of 980nm radiation will have a population inversion of .8 thru 1.0 at positions 2m thru 8m. [Page 164, Fig. 6.5]. Therefore, it would have been obvious to one skilled in the art (e.g. a optical engineer) at the time the invention was made, to maintain an inversion ratio of 0.8-1.0, for the advantage of higher gain discussed on first bullet of pg 162 of Becker.

12. Claims 47 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakabayashi (USP No. 5600481) in view of Naito (USP No. 6034812).

- Regarding claim 47, Nakabayashi discloses an optical amplifier, comprising:
  - a plurality of optical amplification mediums[Fig. 20, #19 = Fig. 19, #14], each producing a gain with a gain-characteristic of a wavelength band; [Col. 2, lines 11-12]
  - a gain controller [Fig. 19, #10] controlling the gain-characteristic [Col. 8, line 5-9] of the wavelength band of each of the optical amplification mediums [Fig. 19, #14] with substantially equal gain-characteristics of the wavelength band; [Col. 8, lines 15-19] and

but fails to disclose:

- a *plurality* of optical gain-equalizers as claimed

Naito teaches

- a plurality of optical gain-equalizers [Fig. 4] respectively positioned after each optical amplification medium [Fig. 16B] equalizing each output light

of the preceding optical amplification medium [Col. 5, lines 55-60] and outputting an output light [Col. 6, lines 12-24], having substantially flat power characteristics [Col. 6, lines 25-28 describe how that 34 and 36 further flatten the gain profile output from the first GEQ.]

Therefore, it would have been obvious to one skilled in the art (e.g. a optical engineer) at the time the invention was made, to use more than one gain equalizer in each amplifier node of Nakabayashi, for the advantage of being able to make cheaper, simpler GEQs individually that when strung together made an effective GEQ that performed well (as taught in abstract).

- Regarding claim 48, Naito discloses [Col. 5, lines 15-23] and [Col. 6, lines 12-28] with help of the figures that each GEQ makes the gain spectrum flatter.

### ***Conclusion***

13. The references made herein are done so for the convenience of the applicant. They are in no way intended to be limiting. The prior art should be considered in its entirety.

14. The prior art which is cited but not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ari M. Diacou whose telephone number is (571) 272-5591. The examiner can normally be reached on Monday - Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/AMD/

20-Feb-08

/Deandra M Hughes/

Primary Examiner, Art Unit 3663